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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,723

03/30/2005

Evert Jan Ditzel

608-449

9138

23117

7590

09/04/2008

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EXAMINER

ZUCKER, PAUL A

ART UNIT

PAPER NUMBER

1621

MAIL DATE

DELIVERY MODE

09/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/529,723	<b>Applicant(s)</b> DITZEL ET AL.	
	<b>Examiner</b> Paul A. Zucker	<b>Art Unit</b> 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 5/15 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 31-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-14 and 31-40 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Current Status***

1. This action is responsive to Applicants' amendment of 15 May 2008.
2. Receipt and entry of Applicants' amendment is acknowledged.
3. Applicant's cancellation of claims 15-30 and 41 -47 is acknowledged.
4. Claims 1-14 and 31-40 are pending.
5. The objection to the specification set forth in paragraph 2 of the previous Office Action mailed 15 February 2008 is withdrawn in response to Applicant's amendment.
6. Claims 1-14 and 31-40 are finally rejected under 35 U.S.C. 103 (a) as being unpatentable over Kitchen et al (US 6,258,978-B1 07-2001). NOTE: For the purposes of this rejection the Examiner considers the limitation "the outlet stream comprises less than 2 vol% oxygen" to require that the percentage oxygen in the outlet stream be maintained at greater than 2% by reducing the alkene partial pressure.

Instantly claimed is a process for producing an alkenyl carboxylate wherein in said process during a process upset, start-up or shut-down, when the catalyst is contacted with the alkene, at a partial pressure, P, optionally in the presence of the carboxylic acid, and the outlet stream comprises less than 2 vol% oxygen, the partial pressure of the alkene is reduced and/or the reaction temperature is reduced so as to suppress formation of benzene and/or suppress inhibition of the catalyst.

Kitchen teaches(Abstract) a process for the production of vinyl acetate by reacting ethylene, acetic acid and an oxygen-containing gas in a reactor to produce a process stream which is removed from the reactor as an outlet stream, the process is improved by maintaining the oxygen concentration of the outlet stream at or near its flammability limit. Adjustment of alkene concentration on the basis of such monitoring necessarily lags oxygen level changes. Kitchen teaches (Column 5, lines 61-67) that the process is carried out in a reactor at a temperature of 100 °C to 400°C and a pressure of between 0.5 barg and 20 barg. Kitchen teaches (Column 6, lines 13-20) the use of air or molecular oxygen as the oxygen source. Kitchen teaches (Column 4, line 47-column 5, line 40) Group VIII, supported catalysts. Kitchen teaches (Column 1, lines 63-67) that control of oxygen levels gives an increase in the productivity and selectivity of his process. Kitchen teaches (Column 2, line 49- column 3) shutting down the reactor on the basis of a change in oxygen concentration. During the shutdown taught by Kitchen, and in order to maintain oxygen levels as Kitchen teaches, one of ordinary skill in the art would have had to modify the alkene concentrations in order to maintain the proper ratio with oxygen. Eventually reactant levels reach 0% and, presumably, temperatures reach ambient after completion of shut down. Though Kitchens is silent with regard to flowing nitrogen through the system during and after shut down, such is obvious since both the alkene starting material and product alkenyl carboxylate are polymerizable and failure to clear the reaction system of these materials would lead to polymer fouling

of the reactor, etc. Kitchens is silent with regard to the presence of benzene, the Examiner therefore presumes none is present.

The difference between the process taught by Kitchens and that instantly claimed is that Kitchens prefers to maintain oxygen levels below 10% while 2% levels are instantly required.

Kitchens, however, teaches (Column 3, lines 15-19) threshold oxygen values at or below 10% which encompass the instantly claimed oxygen values. Kitchens further teaches (*ibid*) that the appropriate levels depend on a variety of factors, the determination of which, presumably, requires experimentation and that controlling the oxygen levels (*vide supra*) leads to increases in selectivity. One of ordinary skill would therefore have been motivated to adjust levels of oxygen at all points in the process (start up, operation, shut down) in order to optimize the selectivity. Kitchens' teaching would have provided a reasonable expectation of success.

Thus the instantly claimed process would have been obvious to one of ordinary skill in the art.

***Examiner's Response to Applicants' Remarks with Regard to This Rejection***

7. Applicants have presented several arguments with regard to this rejection. The Examiner responds to these below:
  - a. Applicants argue that Kitchen teaches the maximization of oxygen levels subject to flammability constraints and that Kitchen exemplifies levels down to 3.1% at a minimum. The Examiner agrees with Applicants but points out that

Kitchens therefore teaches the avoidance of low levels of oxygen in order to maximize selectivity (corresponding essentially to Applicants purpose). This can be accomplished only by varying the ratios of reactant gases and temperatures of reaction and one of ordinary skill in the art following Kitchens' teaching would be practicing Applicants' invention by adjusting the relative partial pressures of alkene and oxygen.

- b. Applicants argue that the conditions of the reaction of the present invention have oxygen levels lower than normal operating conditions such as during shutdown of the process. The Examiner agrees and directs Applicants attention to the rejection of record in which the Applicants process can be seen to correspond to a normal shutdown process in which all material flow is terminated and temperature reduced to ambient.
- c. Applicants indicate that they do not understand the statement " For the purposes of this rejection the Examiner considers the "the outlet stream comprises less than 2 vol% oxygen" to require that the percentage oxygen in the outlet stream be maintained at greater than 2% by reducing the alkene partial pressure". By way of clarification, the Examiner points out that this statement was meant to indicate that reducing the alkene partial pressure would have the natural effect of increasing the oxygen partial pressure in the reactor effluent to above threshold levels. Applicants have already indicated that they understand this by their counter argument that higher conversion would occur. It, however, is unclear what Applicants' argument with regard to

relative alkene and oxygen partial pressures is since *both* oxygen and alkene are consumed which has an impact on the *overall* pressure. Applicants' argument, however, does not address the *relative* partial pressures.

- d. Applicants argue that there is no requirement that the oxygen level be increased above 2%. The Examiner agrees but points out that there is no proscription against it either. Lowering the alkene partial pressure would have the expected result that the oxygen partial pressure would increase absent evidence to the contrary.
- e. Applicants refer to Kitchens teaching of process shutdown at oxygen concentration higher than desired. In response, the Examiner directs Applicants' attention to his response in §7b above.
- f. Applicants argue that Kitchen does not teach maximization during reaction startup. The rejection of record, however, does not address start-up as an issue. Applicants' remarks with regard to start-up are therefore not relevant.
- g. Applicants argue that Kitchen relates to "normal" reaction conditions. As indicated above Kitchen teaches process shutdown which necessarily involves low oxygen levels.
- h. Applicants argue that one of ordinary skill in the art would not have been motivated to practice the instant invention. Kitchen clearly teaches the advantage of increased selectivity which results from adequate outlet oxygen levels in his process. One of ordinary skill in the art would therefore have

been motivated to practice Kitchen's teaching and therefore the instantly claimed process.

Applicant's arguments filed 15 May 2008 have been fully considered but they are not persuasive for the reasons set forth above.

### ***Conclusion***

8. Claims 1-14 and 31-40 are pending. Claims 1-14 and 31-40 are finally rejected.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 571-272-0650. The examiner can normally be reached on Monday-Friday 5:30-3:00.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul A. Zucker/  
Primary Examiner, Art Unit 1621